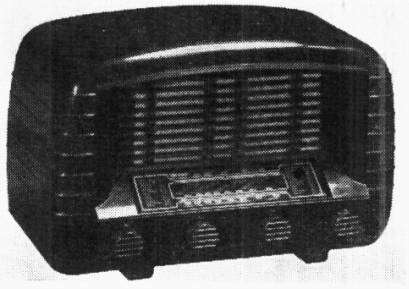
Supplement to Wireless & Electrical Trader, October 13, 1951

"TRADER" SERVICE SHEET 1014

STRAD 511



THE Strad 511, made by R.M. Electric, Ltd., is a 4-valve (plus rectifier) 3-band superhet designed to operate from A.C. mains of 110-250 V, 40-100 c/s. Our sample receiver was designated "2nd run," but the differences in the 1st run are explained overleaf.

Release date and original price: September 1950, £13 16s 9d plus purchase tax.

CIRCUIT DESCRIPTION

Aerial input via I.F. filter **C1, L1** and coupling coils **L2** (S.W.), **L3** (M.W. and L.W.) to single tuned circuits **L4, C24** (S.W.), **L5, C24** (M.W.) and **L6, C24** (L.W.) which precede triode hexode valve **(V1, Brimar 7S7)** operating as frequency changer with internal coupling.

Oscillator anode coils **L9** (S.W.), **L10** (M.W.) and **L11** (L.W.) are tuned by **C30**. Parallel trimming by **C29** (S.W.), **C27** (M.W.) and **C28** (L.W.); series tracking by **C7** (S.W.), **C25** (M.W.) and **C26** (L.W.). Reaction coupling from grid across the common impedance of the trackers, with the addition of inductive coupling via **L7** (S.W.) and **L8** (M.W.). S.W. stabilization by **R3**.

Second valve **(V2, Brimar 7B7)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C4, L12, L13, C5** and **C11, L14, L15, C12**.

Intermediate frequency 465 kc/s.

Signal diode detector is part of double diode triode valve **(V3, Brimar 7C6)** A.F. component in rectified output is developed across volume control **R8**, which acts as diode load, and is passed via **C15** to grid of triode section. I.F. filtering by **C13, R6** and **C14**. Provision is made for the connection of a gramophone pick-up across **R8**. Second diode anode of **V3** is strapped to first. D.C. potential developed across **R8** is fed back via decoupling circuit **R7, C8** as bias to F.C. and I.F. valves giving automatic gain control.

Resistance-capacitance coupling by **R10, C17** and **R12** between **V3** anode and control grid of beam tetrode output valve **(V4, Brimar 35L6GT)**. Variable tone control by **C16** and **R11**. Fixed tone correction by **C19**.

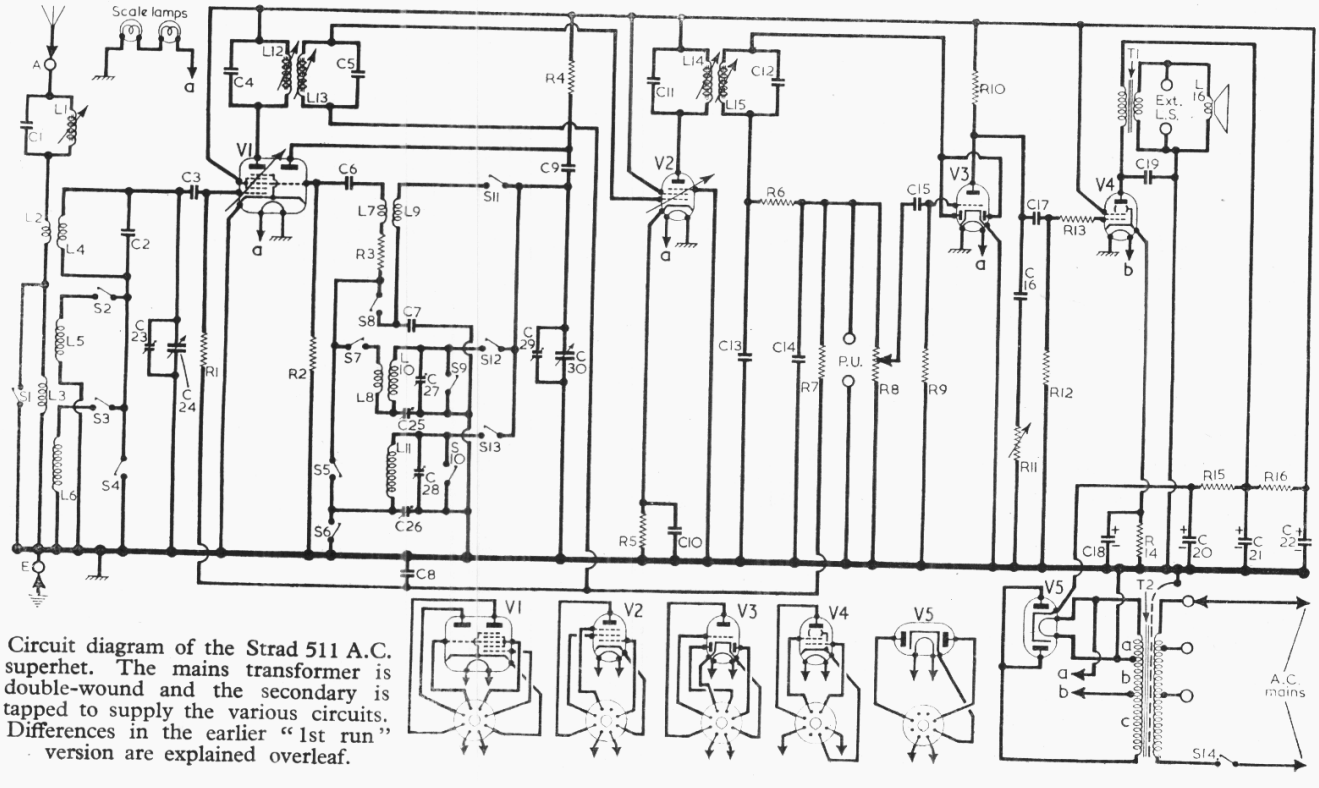
H.T. current is supplied by I.H.C. full-wave rectifying valve **(V5, Brimar 6X5)**. Smoothing by **R15, R16** and electrolytic capacitors **C20, C21** and **C22**. The mains transformer **T2** is double-wound, so that the chassis is isolated from the mains, but there is only a single secondary winding. This is tapped at 6.3 V to feed the rectifier heater and those of **V1-V3**, and at 35 V to feed **V4** heater. The anodes of **V5** are strapped to form a half-wave rectifier and connected to the high-voltage end of the winding.

COMPONENTS AND VALUES

	RESISTORS	Values	Locations
R1	V1 C.G.	820kΩ	F4
R2	V1 osc. C.G. ...	47kΩ	G4
R3	S.W. stabilizer ...	100Ω	G3
R4	Osc. anode load ...	47kΩ	F4
R5	V2 G.B.	270Ω	F4
R6	I.F. stopper ...	47kΩ	E4
R7	A.G.C. decoupling	2·2MΩ	F4
R8	Volume control ...	500kΩ	E3
R9	V3 C.G.	10MΩ	E3
R10	V3 anode load ...	220kΩ	E4
R11	Tone control ...	500kΩ	D3
R12	V4 C.G.	470kΩ	D4
R13	V4 grid stopper ...	47kΩ	D4
R14	V4 G.B.	180Ω	D4
R15 } R16 }	H.T. smoothing ...	180Ω / 8·2kΩ	E4

	CAPACITORS	Values	Locations
C1	I.F. filter tune ...	560pF	G4
C2	S.W. aerial trim. ...	22pF	A1
C3	V1 C.G.	100pF	A1
C4 } C5 }	1st I.F. trans. tuning	120pF / 120pF	A2
C6	V1 osc. C.G. ...	100pF	G4
C7	S.W. tracker ...	0·00379μF	G3
C8	A.G.C. decoupling	0·01μF	F4
C9	Osc. anode coup....	560pF	G4
C10	V2 cath. by-pass ...	0·05μF	F4
C11 } C12 }	2nd I.F. trans. tuning	120pF / 120pF	B2
C13 } C14 }	I.F. by-passes ...	100pF / 100pF	F4
C15	A.F. coupling	0·005μF	E3
C16	Part tone control	0·005μF	E4
C17	A.F. coupling ...	0·01μF	E4
C18*	V4 cath. by-pass ...	25μF	B2
C19	Tone corrector ...	0·0024μF	D4
C20* } C21* } C22* }	H.T. smoothing ...	40μF / 30μF / 20μF	B2
C23†	S.W. aerial trim. ...	30pF	A1
C24†	Aerial tuning ...	§485pF	A1
C25‡	M.W. tracker ...	550pF	A2
C26‡	L.W. tracker ...	175pF	A2
C27‡	M.W. osc. trimmer	40pF	A2
C28‡	L.W. osc. trimmer	80pF	A1
C29‡	S.W. osc. trimmer	30pF	A1
C30†	Oscillator tuning ...	§485pF	A1

* Electrolytic. † Variable. ‡ Pre-set. §"Swing" value, min. to max.



Circuit diagram of the Strad 511 A.C. superhet. The mains transformer is double-wound and the secondary is tapped to supply the various circuits. Differences in the earlier "1st run" version are explained overleaf.

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OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	I.F. filter coil ...	3·25	G4
L2	Aerial coupling coils	1·0	A1
L3		15·0	A2
L4		—	A1
L5	Aerial tun. coils ...	4·5	A2
L6		16·0	A2
L7	Oscillator reaction coils	1·5	G3
L8		0·5	G3
L9		—	G3
L10	Oscillator tun. coils	2·5	G3
L11		6·5	G3
L12	1st I.F. trans. Pri.	10·0	A2
L13	1st I.F. trans. Sec.	10·0	A2
L14	2nd I.F. trans. Pri.	10·0	B2
L15	2nd I.F. trans. Sec.	10·0	B2
L16	Speech coil ...	2·8	—
T1	O.P. trans. Pri.	200·0	E3
	O.P. trans. Sec.	0·75	
T2	Mains trans. a ...	—	C2
	Mains trans. b ...	6·5	
	Mains trans. c ...	30·0	
	Mains trans. Pri. (total)	37·0	
S1-S13	Waveband switches	—	G3
S14	Mains sw., g'd R11	—	D3

DISMANTLING THE SET

Removing Chassis.—Remove four control knobs (pull off);
remove two hexagonal-head self-tapping screws from bottom rear edge of chassis;
withdraw chassis to extent of speaker leads and unsolder them from speaker speech coil tags.

Removing Speaker.—Remove the four 4BA nuts with shakeproof washers securing the edge of the speaker to the baffle;
When replacing, the speech coil tags should be on the right-hand side.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured on our receiver when it was operating from A.C. mains of 230 V, the voltage adjustment being set appropriately. The receiver was tuned to the highest wavelength end of M.W. and the volume control turned to maximum, but there was no signal input.

Voltages were measured on the 10 V and 400 V ranges of a Model 7 Avometer, chassis being the negative connection.

Valves	Anode V	Anode mA	Screen V	Screen mA	Cath. V
V1 7S7	80	3·5			
	Oscillator		80	2·4	—
	53	1·3			
V2 7B7	80	5·5	80	1·8	1·8
V3 7C6	35	0·1	—	—	—
V4 35L6GT	200	28·0	80	0·8	5·0
V5 6X5GT	190†	—	—	—	213·0

† A.C. voltage

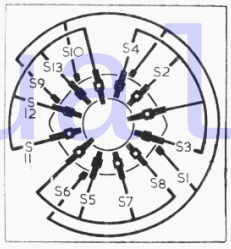
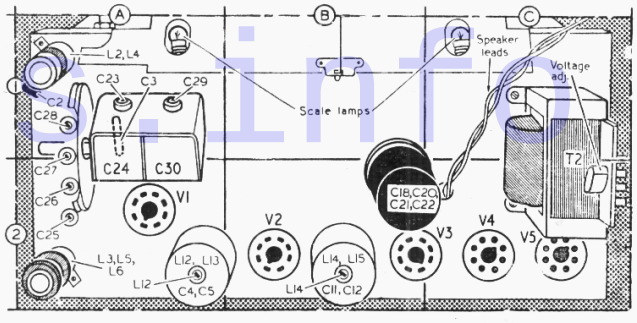


Diagram of the waveband switch unit, as seen from the rear. Below is the associated switch table.

Switches	S.W.	M.W.	L.W.
S1	C	—	—
S2	—	C	—
S3	—	—	C
S4	C	—	—
S5	—	—	C
S6	—	C	—
S7	—	C	—
S8	C	—	—
S9	C	—	—
S10	—	C	—
S11	C	—	—
S12	—	C	—
S13	—	—	C



Plan view of the chassis, showing most of the trimmers.

CIRCUIT ALIGNMENT

Remove chassis from cabinet and connect output from signal generator, via a 0.01 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis.

I.F. Stages.—Switch set to M.W., turn volume control to maximum and gang to minimum. Feed in a 465 kc/s (645.16 m) signal and adjust the cores of **L15** (location reference E4), **L14** (B2), **L13** (F4) and **L12** (A2) for maximum output, reducing the input as the circuits come into line to avoid A.G.C. effects. Repeat these adjustments.

R.F. and Oscillator Stages.—Transfer signal generator leads, via a suitable dummy aerial, to **A** and **E** sockets. With the gang at maximum, the cursor should cover the short vertical line stamped into the bottom right-hand corner of the scale backing plate. As the tuning scale remains fixed in the cabinet when the chassis is withdrawn, use should be made of the calibration card supplied with the receiver.

This card should be secured by tape or a paper clip to the scale backing plate, and positioned so that with the gang at maximum, the cursor coincides with the vertical line labelled "Pointer Set Max. Cap." on the right-hand end of the card. It is advisable to align the receiver with the chassis in the cabinet as the exact trimming and tracking points are difficult to arrive at on the tuning scale.

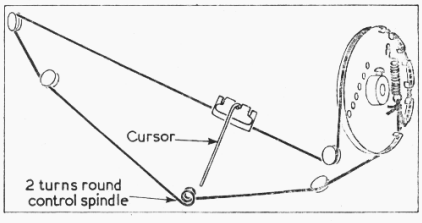
S.W.—Switch set to S.W., tune to 17.64 Mc/s mark on calibration card, feed in a 17.64 Mc/s (17 m) signal and adjust **C29** (A1) and **C23** (A1) for maximum output.

M.W.—Switch set to M.W., tune to 1,500 kc/s mark, feed in a 1,500 kc/s (200 m) signal and adjust **C27** (A2) for maximum output, while rocking the gang for optimum results. Tune to 575 kc/s mark, feed in a 575 kc/s (522 m) signal and adjust **C25** (A2) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 300 kc/s mark, feed in a 300 kc/s (1,000 m) signal and adjust **C28** (A1) while rocking the gang for optimum results. Tune to 150 kc/s mark, feed in a 150 kc/s (2,000 m) signal and adjust **C26** (A2) for maximum output. Repeat these adjustments.

GENERAL NOTES

Switches.—**S1-S13** are the waveband switches, ganged in a single rotary unit beneath the chassis. This is indicated in our underside view of the chassis, and shown in detail in the diagram inset beside the plan view illustration, where it is drawn as seen from the rear of an inverted chassis.



Sketch of the tuning drive system.

The table below it gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and **C**, closed.

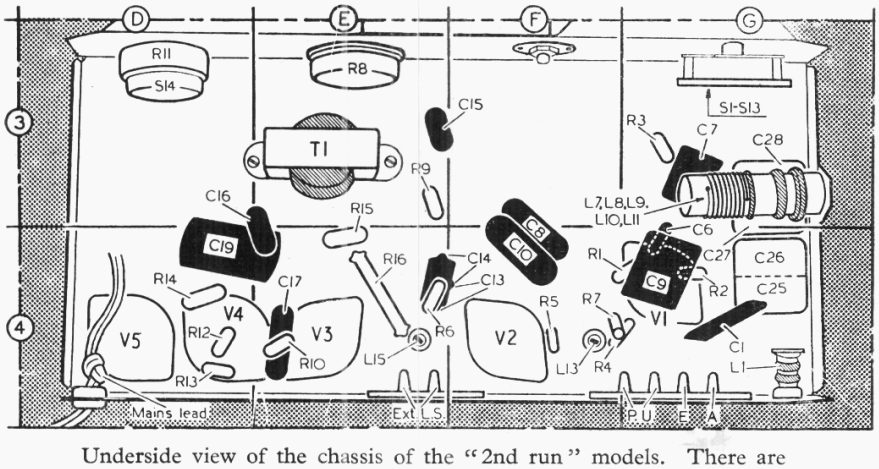
Scale Lamps.—These are two Osram M.E.S. types, with small clear spherical bulbs, rated at 3.5 V, 0.15 A.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 2-3 Ω) external speaker.

"First Run" Modifications.—**V1** and **V2** screens were fed via a common 10 kΩ resistor and 0.1 μF decoupling capacitor, but **R5, C10** were omitted and **V2** cathode went straight to chassis. **R7** was not connected to the volume control circuit, but was connected to the signal diode anode instead. Its lower end, together with the A.G.C. line, went to the second diode anode, the shorting strap being omitted. The I.F. filter **L1, C1** was only fitted where required, but the mounting hole for it was always provided.

Drive Cord Replacement.—Three feet of fine gauge nylon braided glass yarn is required for a new drive cord, which should be run as shown in the accompanying sketch, where it is viewed from the front right-hand corner of the chassis.

Rectifier V5.—In our model this was a 6X5GT, but a 7Y4, with a loctal base, may be fitted. Except for a slightly lower heater current, and a lower H.T. current limit (well outside that required of this receiver), it is electrically similar.



Underside view of the chassis of the "2nd run" models. There are differences in the lay-out in the "1st run" chassis.

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